chapter dealing with the same projections in a slightly more advanced manner, and concluding with a discussion of projections of small areas. The popular description is exceedingly lucid, and the style is everywhere clear. The main defects of the book are that it is not sufficiently systematic, its nomenclature is occasionally at fault, the practical constructions in some cases are not the simplest, and the drawing of the diagrams is somewhat careless, so that statements in the text cannot always be verified on the figures. For Lambert's equivalent azimuthal projection, the author says there is no special name, and he calls Lambert's equivalent cylindrical projection simply the cylindrical projection. He omits Bonne's projection and both the Sanson-Flamsteed and Mollweide (Babinet's), all of which should receive some notice even in a popular work.

He rightly insists on the value of gnomonic projections for seamen, and of equivalent projections in our atlases; and desires the production of cheap and simplified globes.

A. J. H.

Smokeless Powder, Nitro-cellulose and Theory of the Cellulose Molecule. By John B. Bernadou, Lieut. U.S.N. Pp. viii + 200. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1901.) Price dollars 2·50.

THIS small work is of an entirely different character to the usual text-books on explosives, the author confining himself mainly to a theoretical consideration of his subject. To all interested in the manufacture or use of modern explosives the book should be of interest, throwing as it does much light on the theory of nitro-cellulose and mixtures containing this body, such as cordite or powders containing metallic nitrates with nitro-cellulose.

The book is divided into two parts, there being four appendices occupying considerably over half the volume. This latter portion is of most interest, for the author has collected together translations of the admirable papers by (1) Vieille, "Researches on the Nitration of Cotton"; (2) Mendeléef, "Pyrocollodion Smokeless Powder"; (3) Bruley, "The Nitration of Cotton" (an extension of Vieille's work). Appendix iv. consists of an abstract of a lecture by the author on the development of smokeless powder.

In the early pages concise definitions and a list of synonyms are given for the various substances dealt with, which avoids much confusion.

Some interesting work is recorded on the behaviour of guncotton at low temperatures. With liquid air it was found to be "not only not an explosive, but practically a non-combustible; while non-nitrated cotton under similar conditions is a violent explosive."

The remarkable action of very low temperatures in effecting solution of nitro-celluloses is dealt with at some length. McNab and others have shown that an insoluble nitro-cellulose becomes soluble in ether-alcohol at $-50°$, and the author shows that these bodies are soluble in ethyl ether under the influence of intense cold, and with the exception of the highly nitrated insoluble variety, they are soluble in absolute alcohol under similar conditions.

Lieut. Bernadou, in the latter part of the book, advances an ingenious theory of progressive impulses in guns when firing nitro-cellulose-nitro-glycerin charges, or colloided nitro-cellulose with metallic nitrates incorporated. With cordite, for example, "conditions point to there being two intervals in the decomposition of the charge, during one of which a maximum quantity of nitro-glycerin, and, during another, a maximum quantity of nitro-cellulose is burning." Finally, there may be a third impulse due to combination of the gaseous products. This latter appears to obtain confirmation from McNab and Ristori's analyses of the products from the materials separately and cordite (*Proc.* Roy. Soc., lvi. p. 8.)

In the space of a short review it is impossible to deal in a satisfactory manner with the author's theory of the cellulose molecule, many points being open to debate. The author's formulæ show four OH groups in the unit molecule $C_6H_{10}O_5$, which necessitates the assumption that on nitration some of these groups are unattached, whereas if the molecule is considered as having only three OH groups the limit of nitration is easily accounted for. Again, we are asked to assume that at low temperatures ethyl alcohol "under strain" has the composition usually associated with methyl ether, and that colloidisation is brought about by half molecules of ether or alcohol (under strain!) combining with half molecules of the nitro-cellulose.

J. S. S. B.

Catalogue of the Collection of Birds' Eggs in the British Museum (Natural History). Vol. i. By E. W. Oates. Pp. xxiii + 252. Illustrated. (London: Printed for the Trustees, 1901.)

WE have received from the Trustees a copy of this carefully compiled and beautifully illustrated volume, which reflects the greatest credit on all concerned in its production, and should prove invaluable to all ornithologists and egg-collectors. As a matter of fact, it is somewhat more than is indicated by its title, for the exquisitely coloured plates illustrate the chief types of egg form and coloration characteristic of the various groups of birds, so that it forms to a great extent a manual of "oology." We do not on the present occasion propose to review the volume in detail, reserving this till the work is completed. It may be mentioned, however, that the work is practically unique of its kind, the only other catalogue of eggs published by the Museum having been issued so far back as 1852, and treating only of British birds.

The Trustees have been well advised in securing the services of Mr. Oates, whose previous experience rendered him peculiarly qualified to undertake this important task. Of late years, owing largely to generous donors, the collection of eggs in the Museum has increased by "leaps and bounds," and is probably quite unrivalled elsewhere. At the present time it includes more than 50,000 specimens; but even this vast number, according to the author, represents only about one-third of the known species of birds. An interesting feature of the volume is the account of the growth of the collection, which forms a large part of the introduction.

With the bare statement that it includes the eggs of the ostrich-like birds, the tinamus, game-birds, hemipodes, sandgrouse, pigeons, rails, grebes, divers, penguins, petrels, auks, and gulls, we take leave, for the present, of a most valuable and instructive volume.

R. L.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Colours of Guillemots' Eggs.

YOUR reviewer, in dealing with Mr. R. J. Ussher's work on the birds of Ireland (see NATURE, November 29, 1900, pp. 101 and 102), had his attention particularly drawn to two statements concerning the eggs of the guillemot. In the first of these, which occurs on p. 364 of his book, Mr. Ussher puts forward the suggestion that "the beautiful varieties of colouring must help each bird to distinguish her egg from others lying near *until they all become stained and soiled*" (the italics are mine). This is certainly a very pretty hypothesis; but is not the earlier part contradicted by the part I have italicised? It is certainly indirectly contradicted by a statement on p. 365, where Mr. Ussher records his belief that when the eggs of the guillemot are found, as they sometimes are, in the nests of cormorants and kittiwakes, "the owners of the nest incubate the mixed clutches, and not the

guillemots, for I have noticed (he writes) a kittiwake chase away one of the latter from its nest."

If this be so, may we not doubt the propriety of supposing that a probably not very intelligent bird like the guillemot has a better eye for varieties of egg coloration than the kittiwake or cormorant, which cannot distinguish the strange egg dropped in its nest? And if the guillemot has a keen eye for colour, and if this faculty be as useful to the bird as Mr. Ussher suggests, is it not remarkable that natural selection should have permitted the speedy obliteration by stains and soiling of such important guide-marks? Is it not also remarkable that the guillemot, which, on the above-stated theory, needs distinctive marks to guide her to her own egg, should so easily dispense with these marks when her egg is hatched and her young one, so like its fellow-chicks, stands before her?

Why, again, should each guillemot be provided with a conspicuous private egg-pattern when other sea-birds, her neighbours, have to find their homes without such aid?

We have no right to suppose that the guillemot needs guide-marks to enable her to perform acts which are simple in comparison with those performed by many other birds and mammals. The guillemot's egg is stationary. The young of the fur-seal wanders widely amongst thousands of its similar brethren, yet its mother, even after days of absence, never fails to recognise it and will be satisfied with no other. So, too, travellers in the Antarctic tell us that the penguins[1] of that region have no trouble in finding their own offspring. There is no need, however, to multiply instances of what is a perfectly well-known faculty in gregarious animals.

I cannot think that this theory of Mr. Ussher's, so easily made and proportionally difficult to disprove, accounts for the facts of the case.

On the whole, I am inclined to doubt if any *conscious* act of recognition be involved in the return of each guillemot to her own particular egg; for we know that many sea-birds, probably fearing the robberies of the larger gulls, do not willingly leave their eggs unprotected, so that in natural conditions a bird may never actually have to find its egg, but rather its mate whose turn of duty has expired. It seems to me, then, highly probable that, if any conscious act of recognition be involved, it must be dependent upon smell or some other kindred sense.

But surely it is simpler to regard the varied colours of the guillemot's eggs as due purely to a waste product of the bird's metabolism, a product which in some birds, of which the guillemot must be regarded as one, would be forthcoming in abundance at the exciting season of the year, when all the organs of the body are more or less upset by the reproductive processes?

If this view be adopted, diversity of colour follows almost as a matter of course. For it is natural to suppose that in a case like this, where eggs are laid side by side in such large numbers, the question of coloration is unimportant and any colour is admissible which is consistent with the chemical constitution of each particular bird. When I look at a series of eggs of the guillemot I am always reminded of a herd of domestic cattle or a flock of barn-door fowl. In these, when no artificial selection has restricted the colour, the variation is extremely abundant. Like that of the guillemot's egg, however, it has its limits, due to the possibilities of the chemical combinations in the animal concerned. So that while red guillemots' eggs are rare, blue and green cattle are unknown. Further, while in some cases, as in cattle and the eggs of the guillemot, the variation is rich, in others, as in the ass and the eggs of the hedgesparrow, for instance, the range of variation, for reasons at present unknown to us, but probably differing in each instance, is comparatively restricted.

In conclusion, I must add that I am in no sense an opponent of the prevailing theories of protective coloration in birds' eggs as a whole. Such protective colouring almost certainly exists, but I doubt if it be nearly as extensive as is generally supposed, and I would suggest that the coloration is in many cases purely physiological, an aspect of the question which has assuredly been too much nelected.

Orange River Colony. G. E. H. BARRETT-HAMILTON.

Addresses of Authors of Scientific Papers.

MAY I be allowed, through the medium of your columns, to point out the inconvenience that is caused by the omission of an address on authors' separate copies of scientific papers?

[1] See Racovitza, "La vie des Animaux et des Plantes dans l'Antarctique," published by the Société royale belge de Géographie, p. 51, 1900.

Several papers have reached me recently containing valuable and interesting results, but there is nothing to guide me in my search either for the authors' addresses or, in some cases, the name of the periodicals in which their papers were originally published. I am unable, therefore, to acknowledge the receipt of their gift, to send anything in exchange, or to enter into private correspondence with them on their results.

SYDNEY J. HICKSON.

The Owens College, Manchester, October 4.

The Recent Inverness Earthquake.

IN NATURE for September 26 it is stated that the recent Inverness earthquake was not felt in Edinburgh or Glasgow, and apparently the Milne seismograph at the Royal Observatory in the former city gave no indication of any movement. The shock, however, was distinctly felt in Paisley, a few miles west of Glasgow. There are in the Coats Observatory here two seismographs. One of these is a Milne, and it gave no record; but the other, which is Prof. Ewing's, marked the occurrence of the shock. The time as nearly as could be ascertained was 1h. 21m. 35s. The lateral movement was very slight.

ANDREW HENDERSON.

Paisley Philosophical Institution, Paisley, October 14.

THE VIRCHOW CELEBRATION.

A FEW days ago representatives of the world's science met in Berlin to do honour to one of the world's veteran men of science. The occasion of Prof. Virchow's eightieth birthday was seized by many learned societies and private individuals to express their appreciation of the great debt owed by mankind to this epoch-making thinker and worker. The Emperor of Germany bestowed upon him the great gold medal, and the King of Italy a picture in which the Professor's portrait was accompanied by that of his great Italian forerunner, Morgagni. The idea to frame these two scientific men together, whose work, although separated by two centuries of time, illuminated the same branch of knowledge, was certainly a graceful one.

Prof. Virchow was the son of a small farmer in Pomerania, and was born on October 13, 1821. He studied in Berlin, and his first appointment was in connection with the Charité, a hospital which has numbered among its staff many men of European fame. Shortly afterwards Virchow was appointed University Lecturer. About this time he fell somewhat into official disfavour on account, no doubt, of his sympathy with the revolutionary movements of 1848. He left Berlin for the quiet University town of Wurzburg. Here he attracted numerous students and workers, and formed a pathological school which, even after he had quitted it, continued to be one of the best in Europe.

The work by which Virchow will always be known is his "Cellular Pathology." As Lord Lister truly remarked, workers of the present generation cannot conceive the effect which was produced upon the medical world by this book. In 1826 botanists began to regard plants as collections of cells; in fact, Schwann firmly established the position of the cell as the unit of vegetable morphology. Owing, no doubt, to the less distinctly defined characters of the animal cell, it was not until later that Kölliker and others extended the cellular theory to animal tissues. Virchow, in 1858, found a wider application for this theory and demonstrated that pathological tissues also were collections of cells, and that the phenomena of their growth was covered by the generalisation *omnis cellula a cellula*. From that time till to-day Prof. Virchow has been an active worker in pathology, combining the highest critical faculty with an apparently perennial assiduity. In London he is well known; not many years ago (in 1892) he received the Copley medal of the Royal Society, and at that time his great achievements were referred to